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Memorandum: Measuring Innovation in the 21st Century Economy.

To: Members of the Advisory Committee of the Department of Commerce

Date: February 9, 2007

I am writing to bring your attention to the final report on Measuring and Sustaining the New Economy, a project of the Board on Science, Technology, and Economic Policy of the National Research Council. This is entitled ENHANCING PRODUCTIVITY GROWTH IN THE INFORMATION AGE and will be released on February 22, the day of the first meeting of our Advisory Committee. Copies will be available at the meeting and advance copies are available from The National Academies Press:

http://lab.nap.edu/napcgi/discover.cgi?term=enhancing%20productivity&restric=NAP

The section on "Findings and Recommendations", pp. 17-59, is particularly relevant to the work of the Advisory Committee. Recommendations on the measurement of innovation are given on pp. 57-59. The point of departure is that the most important summary measure of innovation for the economy as a whole is growth of output per unit of input. If output expands at the same rate as input, no innovation is taking place. Expansion of output at a faster rate than input requires innovation in products or processes or both.

In the jargon of economic statistics, output per unit of input is called total factor productivity. The term "factor" refers to the inclusion of all of the factors of production, such as labor and capital, in the measure of input. By contrast, "headline" productivity indicators, like the estimates for 2006 released on Wednesday, February 7, are limited to output per hour worked or labor productivity. Growth of labor productivity can occur without innovation through increases in labor quality or capital intensity with no change in technology.

The challenge for innovation measurement is that output per unit of input is not included in our national accounts. These accounts are the main source of information about the growth of our national output, usually measured by the gross domestic product or GDP, and the rate of inflation, measured by the GDP deflator. The principal

recommendation of the STEP Board report is to create a New Architecture for the U.S. National Accounts that will include this vital measure of innovation. The final report lays out the steps that will be required to achieve this goal for the U.S. economy as a whole and for individual industries.

Fortunately, the Bureau of Economic Analysis (BEA), the agency of the Department of Commerce that produces our national accounts, has already taken important steps in this direction:

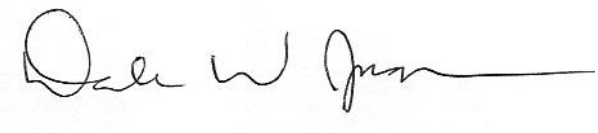
http://bea.gov/about/architecture_national.htm

Detailed plans for creating a "new architecture" are presented in a book I have recently edited with J. Steven Landefeld, Director of BEA, and William D. Nordhaus, Professor of Economics at Yale:

http://www.nber.org/bookstoc/jorg06-1.html

I will discuss the recommendation for creating a New Architecture for the U.S. National Accounts in more detail at our February 22 meeting. I plan to propose the following recommendation for the Advisory Committee: Measures of output per unit of input for the economy as a whole and for individual industries should be included in our national accounts as summary measures of innovation. These can be combined with other innovation indicators at the firm level to provide a comprehensive picture of innovation in the U.S. economy.

Yours sincerely,



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